# AP Calculus AB-1

## Course Description

Calculus is a fusion of a variety of mathematical ideas. When approached with a positive and enthusiastic attitude, calculus can be appreciated as a synergistic kind of mathematics where major ideas through the centuries of humankind come together to form a beautiful explanation of concepts like limits, motion, and accumulation. Calculus relies on thinking about mathematics in a different light, where an object approaches a certain value (instead of equals it) and students are asked to evaluate functions at infinity (instead of at real numbers).

## Prerequisites

PreCalculus 1 and PreCalculus 2, Trigonometry

## Course Materials

*Required*

- Microsoft Office or Google Docs (See the Minimum Technical Skills and Special Technology Utilized by Students)
- Reliable Internet Access
- Laptop or Desktop (Tablets need Puffin app for internet browsing)
- Adobe Acrobat Reader
- TI-84 Graphing Calculator (TI-83 is also acceptable) or TI-Nspire Graphing Calculator

*Recommended*

None

## Course Goals

Upon completion of the course, students will…

- be able to work with functions represented in a variety of ways: graphical, numerical, analytical, or verbal.
- understand the connections among these representations.
- given a polynomial function,  locate intervals of increase/decrease and intervals of positive concavity/negative concavity.
- discuss the meaning of the derivative in terms of a rate of change and local linear approximation
- given a function defined implicitly, find its derivative and/or apply this concept to related rate problems
- apply any of the appropriate rules (constant rule, sum and difference rule, product rule, quotient rule, chain rule) to find the derivative of a function involving factors or components that are polynomial, rational, or trigonometric.
- find the limit of the function as x approaches some constant value (if it exists) or state why it does not exist,  when given a polynomial or rational function

## Units of Instruction

- Unit 1: Limits and Continuity
- Unit 2: Differentiation: Definition and Fundamental Properties
- Unit 3: Differentiation: Composite, Implicit, and Inverse Functions
- Unit 4: Contextual Applications of Differentiation
- Unit 5: Analytical Applications of Differentiation

## Assignments

The course includes the following assignments:

1. 0 Discussions
2. 0 Dropboxes
3. 60 Quizzes (Includes Unit Test and Final Exam)

## Grading / Evaluation

### Grading Scheme

Course grades will be determined as follows:

| | | | |
|---|---|---|---|
| 97% or better | A+ | 77% to 79% | C+ |
| 93% to 96% | A | 73% to 76% | C |
| 90% to 92% | A - | 70% to 72% | C - |
| 87% to 89% | B + | 67% to 69% | D+ |
| 83% to 86% | B | 63% to 66% | D |
| 80% to 82% | B - | 60% to 62% | D- |
| | | 59% or less | F |

### Assignment Descriptions and Weightings

The assignments for this course are weighted as follows:

| Assignments | Percentage of Final Grade |
|---|---|
| Course Work (Discussions, Dropboxes and Quizzes) | 80% |
| Final Exam | 20% |
| **Total** | **100%** |

## Instructor Contact Response Time

Contact information for the Indiana Online Instructor can be found by clicking on the Course Home link in the navigation menu.

The instructor will respond to student inquiries (email, text, call) **within 24 hours**. Assignments will be graded within 24 hours and grades will be posted.

### Information about Final Exam

The Final Exam must be proctored. Final Exams count for 30% of the total grade. Coursework and the Final Exam will determine the Final Grade.

## Expectations for Academic Conduct

### Student Handbook

It is your responsibility to read the student handbook and contact your instructor if you have any questions.

### Acceptable Use & Netiquette Policy

The Acceptable Use Policy outlines the guidelines and behaviors that all users (administrators, teachers, students and parents) are expected to follow when participating in the Indiana Online program.

### Academic Integrity

Honesty is the Indiana Online policy!

### CIPA

The Children's Internet Protection Act (CIPA) is a federal law enacted by Congress to address concerns
about access to offensive content over the Internet on school and library computers.

## Assistance for Students with Disabilities

Indiana Online supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, such as inaccessible web content, or the use of non-captioned videos and podcasts, reasonable accommodations can be arranged.

Learn more about the accessibility features in Indiana Online's Learning Management System (LMS), Desire2Learn.

### Suggested Assistive Technologies

- Screen Readers: VoiceOver and NVDA
- Chrome Extensions: ChromeVox and Speakit!

## Minimum Technical Skills and Special Technology Utilized by Students

This course is totally online. All instructional content and interaction takes place over the internet. In addition to baseline word processing skills and sending/receiving email with attachments, students will be expected to search the internet and upload / download files. In addition, students may need one or more of these technology plug-ins to access course materials and content.

*Students should have access to Microsoft Office or have an established Google account to work on course documents.*

Technical Questions? Please contact the Indiana Online Helpdesk.